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EXAMINER

LAVARIAS, ARNEL C

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2872

DATE MAILED: 11/07/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/875,021

Applicant(s)

KIHARA, NOBUHIRO

Examiner

Arnel C. Lavarias

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CH

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-10 and 12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-10 and 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. Applicant has requested that the Examiner further consider Figure 12, discussed in the Background of the Invention of the disclosure, to determine whether it should be labeled as "Prior Art". The Background of the Invention of the disclosure does not specifically state Figure 12 to be prior art. The Examiner believes Figure 12 to be acceptable, however, the Applicant is invited to submit a drawing correction and/or formal drawing for Figure 12, adding the label "Prior Art" as necessary.

Specification

2. The disclosure is objected to because of the following informalities:
Page 4, line 19- "Figs. 6A and 6B are" should read "Figs. 6A-6C are".
Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
4. Claims 1-4, 7-10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (4783133) in view of Benton (4834476) or Molteni et al. (5473447).

With regard to Claim 1, Chen discloses a holographic stereogram exposure apparatus comprising a means for separately displaying a plurality of images in a parallax direction (See 88 in Figure 11); and an object beam optical system (See 84 of Figure 11; col. 9, line 57-col. 12, line 2) that projects light beams passing through the plurality of images displayed to form a superposed image of said plurality of images, and condenses the superposed images to separately project the plurality of images in the parallax direction on a holographic recording medium (See 92 of Figure 11); wherein each of the plurality of images corresponds to a respective element hologram, and the number of the plurality of images is less than the number of element holograms included in the holographic stereogram (See col. 9, line 57-col. 13, line 42).

With regard to Claim 2, Chen discloses a reference beam optical system (See 128 of Figure 11; col. 9, line 57-col. 12, line 2) that projects a reference beam onto the hologram recording medium for interference with the plurality of images projected on the hologram recording medium (See 92 of Figure 11).

With regard to Claim 3, Chen discloses the object beam optical system comprising a superposed projection optical system (See 118 and 120 of Figure 11) for projecting the light beams passing through the means for separately displaying a plurality of images in a parallax direction (See 88 of Figure 11), and a beam-condensing projection optical system (See 122 and 124 of Figure 11) for condensing the superposed image to project the plurality of images onto the hologram recording medium.

With regard to Claim 4, Chen discloses means for separately displaying a plurality of images in a parallax direction being divided in a horizontal direction (See 118 in Figure

11; col. 10, lines 31-37). In this case, the x-axis in Figure 11 is noted as the horizontal direction.

With regard to Claim 7, Chen discloses the beam-condensing projection optical system (See 122 And 124 of Figure 11) of the object beam optical system projecting the superposed image onto the hologram recording medium (See 92 in Figure 11) in a non-parallax direction and condensing the superposed image in a parallax direction (See col. 10, lines 37-46). In this case, the x-axis in Figure 11 is noted as the parallax direction and the y-axis is noted as the non-parallax direction.

With regard to Claim 8, Chen discloses the beam-condensing projection optical system using a first-group lens (See 122 in Figure 11) and a second-group lens (See 122 in Figure 11; col. 10, lines 37-46) to guide the superposed image to a beam-condensing cylindrical lens.

With regard to Claim 9, Chen discloses the beam-condensing projection optical system of the object beam optical system being provided with a correction lens (See 122 in Figure 11; col. 10, lines 37-46) between the first-group lens and second-group lens for correcting unevenness of the angle of the field for each element hologram on the hologram recording medium.

With regard to Claim 10, Chen discloses a holographic stereogram exposure method comprising an object beam projection step (See 84 in Figure 11; col. 9, line 57-col. 12, line 2) and a reference beam (See 128 in Figure 11; col. 9, line 57-col. 12, line 2) projection step, wherein each of the plurality of images corresponds to a respective element hologram, and the number of the plurality of images is less than the number of

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element holograms included in the holographic stereogram (See col. 9, line 57-col. 13, line 42).

With regard to Claim 12, Chen discloses a holographic stereogram generation system comprising an image generation system (See Figure 1; col. 7, lines 10-34; 88 in Figure 11), an object beam optical system (See 84 in Figure 11), and a reference beam optical system (See 128 in Figure 11), wherein each of the plurality of images corresponds to a respective element hologram, and the number of the plurality of images is less than the number of element holograms included in the holographic stereogram (See col. 9, line 57-col. 13, line 42).

Chen discloses the invention as set forth above. Chen lacks the means for separately displaying a plurality of images in a parallax direction being a spatial light modulation means. However, Benton and Molteni et al. both teach a holographic stereogram exposure apparatus (See for example Figures 1, 2, or 4 in Benton; Figures 5 or 9 in Molteni et al.) wherein the means for displaying a plurality of images in a parallax direction is a spatial light modulator (See col. 3, lines 7-30, col. 7, lines 3-22 in Benton; col. 16, lines 8-23 in Molteni et al.). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a spatial light modulator means, as taught by either Benton or Molteni et al., in the holographic stereogram exposure apparatus and method as disclosed by Chen. One would have been motivated to do this to utilize computer-generated holograms to quickly generate the two-dimensional perspective views, as well as shorten the processing time as compared to using film and a projector.

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5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (4783133) in view of Benton (4834476) or Molteni et al. (5473447) as applied to Claims 1 and 3 above, and further in view of Brooks et al. (4082415).

Chen in view of Benton or Molteni et al. discloses the invention as set forth above in Claims 1 and 3. Chen in view of Benton or Molteni et al. lacks the spatial light modulation means being divided into both vertical and horizontal directions. However, Brooks et al. teaches that a multiple lenslet array can be disposed in the path of the object beam in a holographic recording apparatus (See 11 of Figure 1; col. 3, line 31-col. 4, line 10) to provide parallaxes in both the vertical and horizontal direction. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a multiple lenslet array, as taught by Brooks et al., in place of the lenticular lens array in the holographic stereogram exposure apparatus as disclosed by Chen in view of Benton or Molteni et al. One would have been motivated to do this to provide improved uniformity and efficiency in recording the resultant hologram on the hologram recording medium.

Response to Amendment

6. The amendments to the specification of the disclosure in Paper No. 5, dated 9/27/02, are acknowledged and accepted.
7. The cancellation of Claims 6 and 11 in Paper No. 5, dated 9/27/02, are accepted and acknowledged.

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8. The amendments to Claims 1-5, 7-10, and 12 in Paper No. 5, dated 9/27/02, are accepted and acknowledged.

Response to Arguments

9. In view of the cancellation of Claim 6, the rejection of Claims 6-9 under 35 U.S.C. 112, first paragraph, is respectfully withdrawn.
10. In view of the amendments made to Claims 2-5, 7-10, and 12, the objections to Claims 2-9 and 12 are respectfully withdrawn.
11. The Applicant argues that Chen fails to teach or reasonably suggest the number of images projected on the hologram recording medium being less than the total number of parallax images included in a single holograph stereogram, as recited in newly amended Claim 1. The Examiner respectfully disagrees. Chen specifically states that the light modulation means (i.e. transparency 88 in Figure 11) contains multiple two-dimensional images of the scene earlier photographed (See col. 10, lines 29-31). Additionally, the lenticular lens array (118 of Figure 11 in Chen) is such that the lenslets in the array will determine the number of images in the transparency (See col. 13, lines 21-42), which inherently lead to the number of images projected on the hologram recording medium being less than or equal to the total number of parallax images included in a single holograph stereogram. Finally, Chen discloses that at least two exposures of the same transparency is required to reduce grid line effects, wherein the two exposures of the same transparency are offset (See col. 10, line 47-col. 11, line 30; col. 13, lines 4-15). Thus, the total number of parallax images included in a single holograph stereogram is at

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least twice the number of images projected on the hologram recording medium in one exposure.

12. The Applicant argues that Chen fails to teach or reasonably disclose providing a plurality of images used to form a holographic stereogram image. The Examiner respectfully disagrees. Chen specifically states that states that the light modulation means (i.e. transparency 88 in Figure 11) contains multiple two-dimensional images of the scene earlier photographed (See col. 10, lines 29-31). The photographs of the scene are of different viewpoints or parallaxes of the scene.
13. The Applicant argues that the apparatus of Chen (i.e. Figure 11) relates only to the production of rainbow holograms from photographs taken in incoherent light with a lenticular lens array to produce parallax information. The Examiner agrees, however, Chen specifically states that the apparatus of Figure 11 is very much suitable for producing holograms containing multiple viewpoints of a scene or image. In particular, Chen states that the apparatus in Figure 11 is intended for use with monochromatic coherent light, and modifications to the apparatus are required so that the requisite rainbow holograms are produced (See Figure 11; col. 12, lines 32-40).
14. The Applicant argues that there is insufficient reason or suggestion to combine the teachings of Chen and Brooks et al. The Examiner respectfully disagrees. One skilled in the art of holography would realize that the apparatus of Chen (Figure 11 of Chen) and the apparatus of Brooks et al. (Figure 1 of Brooks et al.) are essentially two-beam holographic recording schemes that are well-known in the art. The motivation for

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substituting a lenticular lens with a multiple lenslet array, such as a fly's eye lens array, was stated in Paper No. 4, dated 6/27/02 (See also col. 8, lines 1-27 of Brooks et al.).

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 703-305-4007. The examiner can normally be reached on M-F 8:30 AM - 5 PM.
- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1687. The fax phone numbers

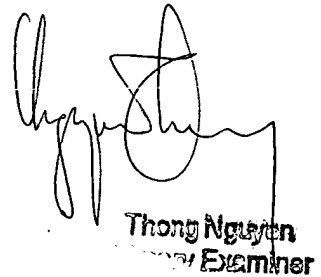
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for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Arnel C. Lavarias
November 6, 2002



Thong Nguyen
Examiner